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DRAWINGS ATTACHED

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(54) IMPROVEMENTS IN OR RELATING TO GRINDING MECHANISMS FOR ELECTRIC COFFEE MILLS

(71) We, ROBERT BOSCH HAUSGERAETE GMBH, a German Company, of 4, Breitscheidstrasse, Stuttgart, Germany, do hereby declare the invention, for which we

pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a grinding mechanism for a coffee mill driven by an electric motor.

According to the present invenion a grinding mechanism for an electrically driven coffee mill comprises a grinding cone and a grinding ring, the grinding cone being fixedly arranged within a housing surrounding the grinding mechanism and the grinding ring being rotatably mounted in a bearing ring and being restrained against axial displacement therein, the bearing ring being axially displaceable within said housing relatively to the grinding cone.

The elements of the grinding mechanism are thereby adjustably mounted within the the housing and the ground coffee falls freely into a collecting receptacle below without the aid of special scraping tools. Moreover, owing to the interposition of a ball bearing, the grinding moment is transmitted with only small friction forces from the grinding ring to an adjusting device for the fine adjustment of the grinding mechanism. Spring detent means of the adjusting device therefore need merely to be slightly extended, so that the fine adjustment of the grinding mechanism only requires slight finger pressure.

The grinding cone, round which the axially adjustable grinding ring rotates, is preferably able to be screwed from the underside of the housing of the coffee mill on a threaded pin, which is held above the grinding mechanism by ribs or like supporting elements and extends vertically downwards into the centre of the grinding ring so that the lower faces of the screwed-on cone and grinding ring lie approximately in the plane of the underside of the housing. Therefore difficult inaccessible corners or cavities near to and underneath the grinding mechanism are avoided in which indeterminate amounts of ground coffee are caught and deposited, which are detrimental to an exact measurement and to the aroma of the coffee.

The present invention will now be further described by way of example, with reference to the accompanying drawings, in which:—

Fig. 1 shows a diagrammatic view of the coffee mill;

Fig. 2 shows a plan view of the coffee mill according to Fig. 1 with the housing cover removed, and on a larger scale than Fig. 1; and

Fig. 3 shows a vertical section through the centre of the grinding mechanism on the same scale as Fig. 2.

The coffee mill 10 according to Fig. 1 is carried by a mounting foot 11, which can be placed on a table, and which keeps the underside of the coffee mill freely accessible. A collector 12 for the ground coffee is inserted in known way under the coffee mill in a holder 13 of the housing of the coffee mill, while a supply container 14 fits above it on this housing. Both containers are made of a transparent material.

The housing of the coffee mill consists of a base 15a and a cover 15b placed on and fastened thereto. As shown in Fig. 2, an electric motor 16 and a coffee grinding device 17 driven by the motor are mounted on the base 15a of the housing. From Fig. 3 it is seen that the cover 15b of the housing has an opening for the entrance of the coffee beans over the grinder and projects downwards around this in the shape of a funnel to the upper edge of a hollow cylindrical housing part 15c projecting vertically upwards from the bottom 15a of the housing. This part 15c serves for the reception of the

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grinder 17. It is also open at the top and has there a funnel-shaped part 15d, which ensures that the coffee beans slide freely through to the place where they are ground on entering from the supply container 14. The base 15a of the housing has also an opening corresponding to the inside diameter of the hollow cylindrical housing part 15c, and in this opening the inner wall of the hollow cylindrical part 15c is provided up to about half its height with a screw thread 18 (Fig. 3).

The electric motor 16 is placed beside the cylindrical housing part 15c flat on the bottom 15a and has on its driving shaft a worm gear 19, which cooperates with a horizontally rotating worm gear wheel 20 of the grinder 17. The worm gear wheel consists of a plastic material and has a cylindrical enlargement extending downwards (in Fig. 3), in the inside space of which enlargement a grinding ring 21 is inserted. The worm gear wheel and grinding ring are mounted rotatably in a bearing ring, which consists of two separate rings 22 and 23 which can be screwed side by side into the screw thread of the housing part 15c from the base 15a. The rotatable parts run on balls 24, which are located in ball tracks on both sides. An annular groove 25 on the peripheral face of the worm gear wheel forms the inner track. The outer track is formed by two conical rolling surfaces 26, turned towards on another, of the two adjacent rings 22 and 23 screwed into the housing part 15c, which rings are connected, taking into consideration the necessary bearing clearance, by a cylindrical pin 27.

The grinding ring 21 runs round a fixed grinding cone 28. For fastening it the funnel-shaped part 15d has on the upper edge of the housing part 15c three ribs 29, which extend horizontally towards the centre of the funnel-shaped part 15d and terminate in a vertical sleeve 30. A hollow space in this sleeve 30 accommodates a threaded bolt 31, which is inserted vertically from above and extends downwards into the centre of the grinding ring 21. The grinding cone 28 is screwed on to the lower end of the threaded bolt from below and has two blind holes 32 on its lower, freely accessible face. A key can cooperate with the holes 32 for tightening and release of the grinding cone 28. The lower faces of the grinding ring, cone and bearing ring lie in the plane of the housing base 15a, and thus terminate at the bottom with the housing.

The determination of the degree of fineness of the ground coffee is effected by axial adjustment of the grinding ring 21 with respect to the fixed grinding cone 28. This adjustment is effected by an articulated push device. The push device includes an actuating knob 33 which is attached inside the housing to a member 34 to which one end of a push rod 35 is connected. The other end of the push rod is inserted in a hole 36 of the bearing ring 22, 23. When the adjusting knob is moved, therefore, the bearing ring turns in the thread 18 in the direction of the screw, while the bearing ring and the grinding ring rise or fall with respect to the grinding cone. The fineness adjustment is secured with a known spring detent device 37.

For adjustment of the grinding ring with respect to the cone for coarse grinding, the bearing ring 22, 23 has several holes 36, which are arranged as in Fig. 2 in series in the peripheral direction of the ring. Consequently, the corresponding end of the push rod 35 may be inserted in one or other of these holes according to choice, which then results in the adjustment of the grinding ring.

WHAT WE CLAIM IS:—

1. A grinding mechanism for an electrically driven coffee mill comprising a grinding cone and a grinding ring, the grinding cone being fixedly arranged within a housing surrounding the grinding mechanism and the grinding ring being rotatably mounted in a bearing ring and being restrained against axial displacement therein, the bearing ring being axially displaceable within said housing relatively to the grinding cone.

2. A grinding mechanism for a coffee mill as claimed in claim 1, in which the grinding ring is inserted into a worm gear wheel consisting of a plastic material which has in its peripheral face an annular groove which serves for the reception and as a race for the rolling parts of a ball bearing.

3. A grinding mechanism for a coffee mill as claimed in claim 1, in which the grinding cone can be screwed from underneath the housing onto a threaded bolt, which bolt is held above the grinding mechanism by rigs or like holding parts of the housing and extends vertically downwards in the centre of the grinding ring.

4. A grinding mechanism for a coffee mill as claimed in claims 1 to 3, in which the lower faces of the grinding cone and grinding ring lie approximately in the plane of the underside of the housing.

5. A grinding mechanism for a coffee mill as claimed in claims 1 to 4, in which the bearing ring which rotatably accommodates the grinding ring is provided with an outside thread and is screwed into an inner thread in the grinding mechanism housing whereby the bearing ring is axially displaceable in the housing.

6. A grinding mechanism for a coffee mill as claimed in claims 1, 2 and 5, in which the bearing ring rotatably receiving the grinding ring consists of two rings which are connected together, are screwed successively into

the housing and having facing surfaces in their inner peripheries for the rolling parts of a ball bearing.

7. A grinding mechanism for a coffee mill as claimed in any one of the claims 1 to 6, in which a push rod of an articulated push device is connected at one end to an adjusting member held movably on the housing, and at the other end to the bearing ring of the grinding ring so that the adjusting force of the articulate push device acts tangentially on the bearing ring, the spiral rotary movement of which is transmitted as axial movement to the grinding ring.

8. A grinding mechanism for a coffee mill as claimed in claim 7, in which a series of holes are provided in the periphery of the bearing ring serving to selectively receive said other end of the push rod.

9. A grinding mechanism for a coffee mill constructed and arranged and adapted to be operated substantially as hereinbefore particularly described with reference to and as illustrated in the accompanying drawings.

10. A coffee mill incorporating a grinding mechanism as claimed in the preceding claim, constructed and arranged and adapted to be used substantially as hereinbefore particularly described with reference to and as illustrated in the accompanying drawings.

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1218611 COMPLETE SPECIFICATION

1 SHEET This drawing is a reproduction of the Original on a reduced scale

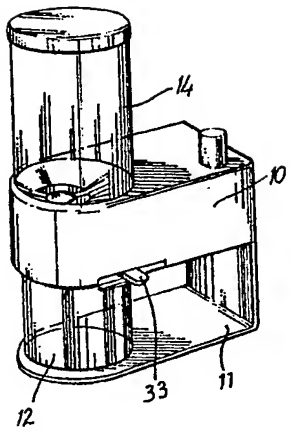

FIG.1.

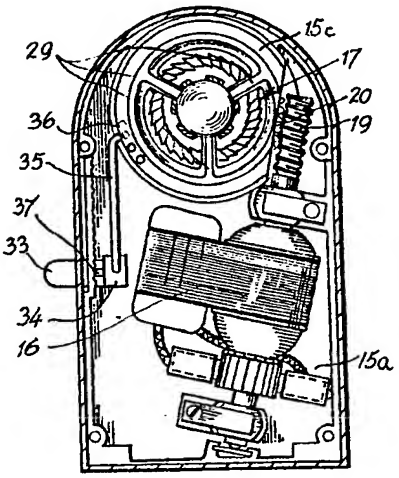

FIG.2.

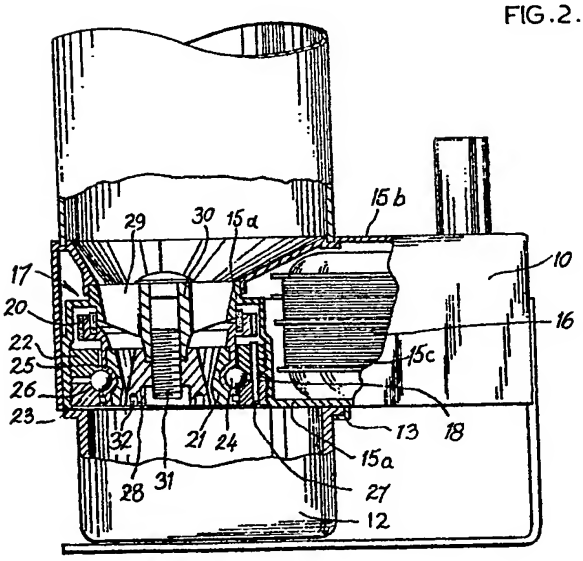

FIG.3.